

# **Losing the Race: Ancestry, Identity, and the Problem of Human Variation**

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When forensic anthropologists are asked to help identify human remains, we try to develop a biological profile, which includes sex, age at death, and stature. We are also asked to assign the individual to one of several categories that St. Hoyme and Iscan (1989) call bureaucratic races, social categories established by government agencies. Missing person reports are organized by bureaucratic race, and forensic anthropologists try to help narrow down the possibilities in naming the unidentified. Although it is possible to scientifically quantify and describe human biological variation (Sauer 1992, Graves 2001), linking this variation to socially recognized racial categories or bureaucratic races is problematic. Forensic anthropologists have traditionally not pointed this out to the agencies requesting their services (Sauer 1992, 1993), and this has perpetuated the misconception that there is a biological basis to race. Further, some forensic anthropologists have substituted the term "ethnicity" or "ethnic group" for race, although the terms are not synonymous.

In this paper and in light of my own work (Wedel 2001, 2006; Wedel et al. 2001-2006), I situate the discussion of the race in the context of the historical etiology of the terms and their misuse in forensic anthropology and the changing nature of the social categories themselves. I also describe how the skeletal material used in forensic research was organized. Because the skeletons have always been organized by race, our methods may be of limited utility. Finally, I critically examine how useful categorizing skeletons is in the first place. Individuals may self identify in ways that cannot be read from the traits exhibited on their skeletons. Because of the problems associated with being asked by law enforcement for bureaucratic race and responding with a description of biological ancestry, and the potential for the two to be in conflict, assessments of ancestry may be more of a liability than a useful tool in determining an individual's identity. I recommend that forensic anthropologists discontinue use of the term race and approach assessments of ancestry with caution.

## **Race, Ancestry, and Ethnicity**

Historically, race has been used as an umbrella term that encompassed ancestry, ethnicity, and ideas of biological determinism (Caspari 2003). Anthropologists now recognize that race, ancestry, and ethnicity are more than euphemisms in politically correct times; they are interdependent concepts. Socially constructed races are based on a "set of cultural or ethnic factors combined with easily perceived morphological traits (such as skin reflectance, body shape, crania structure)

in an artificially "biologized" category" (Fuentes 2007). Biological races are variants with isolated biological difference within one species, in essence separate branches on one evolutionary tree (Caspari 2003). Modern humans are not sortable into biological races (Lewontin 1972, Graves 2001). A majority of physical anthropologists acknowledge this (Caspari 2003). When biological anthropologists assign individuals to a race, they are misrepresenting the evidence that proves human variation forms a continuum (see Smay and Armelagos (2000) for a complete discussion of this).

The question then becomes, "What is the source of the variation forensic anthropologists are trying to sort?" Forensic anthropologists recognize non-metric features (shape of facial bones, dental traits, etc.) and look for the population (among chosen reference samples) in which those traits are found in the highest frequency. We then take a series of anthropometric measurements and statistically determine to which group the measurements are most similar. Forensic anthropologists are looking for phenotypic evidence of biological inheritance, or ancestry. Ancestral groups are "regional clusters of populations [that] owe the similarities in their appearance to the perpetuation of traits that are shared by virtue of kinship but which have no other biological significance" (Brace 1995:173). Forensic anthropology's methods have been devised to identify these ancestral similarities in appearance. Traits tend to cluster within groups historically separated by continents, and for this reason, Goodman argues that "the rhetoric of racial types could easily be changed to continental ancestry without affecting law enforcement's efforts" (1995:224).

Ethnicity is another term that must be distinguished from social race, biological race, and ancestry. Ethnicity is a term that refers to the belief of individuals in common descent (Barth 1969). Ethnicity is used today to describe individuals who identify with others who share common cultural practices, linguistic traditions, beliefs, and possibly but not exclusively in biological ancestry. Although evidence of ethnicity may be present as individuating features on the skeleton (cranial modification, dental modification, foot binding, mortuary practices, etc.), these features must not be confused with the inherited traits that indicate biological ancestry.

Further confusion sets in when forensic anthropologists are asked to work within bureaucratic categories of race. Bureaucratic races are social categories defined by the government for the collection and use of demographic data (St. Hoyme and Iscan 1989). The bureaucratic race categories used by the US Census Bureau and defined by the Office of Management and Budget include White, Black, American Indian or Alaska Native, Asian, Native Hawaiian or Pacific Islander, and "some other race" ([www.census.org](http://www.census.org)). "The U.S. Census Bureau complies with the Office of Management and Budget's standards for maintaining, collecting, and presenting data on race, which were revised in October 1997. They generally reflect a social definition of race recognized in this country. They do not conform to any biological, anthropological, or genetic criteria" ([www.census.org](http://www.census.org)). As of 2000, individuals can

self-identify on the census as belonging to more than one bureaucratic race, and can be of Hispanic or non-Hispanic ethnicity. The term "race" carries historical and bureaucratic baggage and is not clearly defined outside a strictly biological context. Using the term uncritically perpetuates this confusion. Anthropologists should be explicit with their language and make it accessible to a lay audience.

In my current research on archaeological remains from historical African American cemeteries, I had to consider the intersections of race, ancestry, and ethnicity and their implications for skeletal biology (Wedel 2006). I am examining the skeletal remains of enslaved and freed Africans and African Americans for evidence of health and nutritional status. By the logic of historical physical anthropology, where the differences between race and ancestry have not generally been acknowledged, the enslaved and free African Americans are Black or Negroid by race. However, combining a diverse group of individuals taken from western and central Africa, the Caribbean, and South America into one race fails to account for the diverse genetic variation these individuals likely brought to America. The enslaved individuals were gathered opportunistically in specific geographic areas, yet without regard for common biological descent. To call this heterogeneous group *Black* more accurately refers to the social experiences in which they shared during enslavement, emancipation, and reconstruction. Regardless of their biological ancestry, Blacks were forced into servitude, abused, and emancipated without recompense. During emancipation and reconstruction, Blacks were legislated out of skilled trades and discriminated against for sanitary and safe housing (White 1990, Horton and Horton 1997, Rankin-Hill 1997). *Racism* is the appropriate term to use in describing the social oppression these individuals suffered.

By trying to quantify the biological effects of slavery and emancipation, I am looking at the effects of *racism* on 150 years of phenotypic variation. I cannot comment on ancestry or its effects in any significant way. Further, the ethnic variation present at the time was more varied than the places from which the enslaved were taken. The enslaved individuals were considered one race, but were of varied ancestry and ethnicity. This example illustrates the importance of distinguishing between the terms race, racism, ancestry, and ethnicity. To further understand how the race concept has been used in forensic anthropology, a historical perspective is required.

### **History of Race in Forensic Anthropology**

Forensic anthropology has its roots in anatomy, a largely acultural and atheoretical discipline concerned primarily with describing morphological variation and function (Stewart 1979; Blakey 1987, 2001). Anatomists of the early 20<sup>th</sup> century labeled individuals by race on the basis of external features such as hair texture and skin color. Little thought was given to the derivation of these features or their

significance, either evolutionary or otherwise (biomechanical, ontological, nutritional, etc.).

The earliest physical anthropologists followed similar practices in assigning race<sup>1</sup>, probably because they had been trained by anatomists. Skeletal collections were established, and the skeletons were organized by the characteristics apparent before the bodies had been de-fleshed (Walker 2000). Race was simply "observable difference," and research methods including anthropometry and craniometry were developed to quantify this difference. Little consideration was given early on to the fact that anthropometric measurements of skulls and long bones might poorly correlate with whole body phenotype. Cadavers from medical school dissecting tables were reduced to skeletons, and measurements were taken to confirm the information known about the individual, including his or her age, stature, sex, and race (as then defined).

As a sub-discipline, forensic anthropology developed over the course of the 1900s. In the beginning, anatomists and later physical anthropologists infrequently consulted with local law enforcement. Large skeletal collections amassed in the 1800 and 1900s provided sources of data for the development of methods of skeletal identification. The Civil War and later wars provided impetus for the development of methods to identify skeletal remains, as well as an additional source of skeletal remains upon which to test fledgling methods (Walker 2000). Anthropologists began conducting applied research to aid in the identification of human remains (Stewart 1979).

Between 1939 and 1972, forensic anthropology developed and grew in prominence, in part due to the success of research methods and identification techniques. Publications and textbooks were dedicated to the topics of forensic anthropology and its methods, and, in 1972, its practitioners organized themselves into a chapter of the American Academy of Forensic Sciences (Thompson 1982).

During most of the 20<sup>th</sup> century, the race concept received little discussion or justification by forensic anthropologists. The earliest publications of research methods and techniques for identifying skeletal remains presented race with little or no theoretical or biological background. Authors including Krogman (1939) and Kerley (1973) provided charts and drawings to show how race was assessed from skeletal features. They omitted discussions of why the differences existed. Later authors, including Brace (1995), began using the term ancestry and provided brief explanations of which characteristics are used and how these characteristics are inherited. Most recently and perhaps in response to criticisms by the rest of the anthropological community, forensic anthropologists have dedicated entire manuscripts to what the misnomer race actually describes: heritable or ancestral biological differences.

The history of the race concept within physical anthropology can be divided into three periods (Thompson 1982). Ales Hrdlicka and Earnest Hooton serve as examples in this paper for the early years, prior to 1939. The writings of Wilton Krogman and T. Dale Stewart are discussed for the middle period of development, 1939-1972, and articles by St. Hoyme and Iscan, Brace, and Kennedy are reviewed for the modern period, 1972 to the present. Several authors, including Stewart (1979), Thompson (1982), Iscan (1988), and Ubelaker (1996), have comprehensively detailed forensic anthropology's history using these three time periods, and their work will be referred to here as necessary.

### **The Race Concept Pre-1939: Hrdlicka and Hooton**

Contemporaries Ales Hrdlicka and Earnest Hooton were two of the earliest physical anthropologists to consult on medico-legal investigations of death. In 1903, Ales Hrdlicka became the first physical anthropologist to be employed by the Smithsonian Institution. Hrdlicka was instrumental in establishing the *American Journal of Physical Anthropology* in 1918 and in inaugurating the American Association of Physical Anthropologists in 1928 (Stewart 1980). Hrdlicka also assembled most of the Smithsonian's vast skeletal collections. He procured the holdings of the Army Medical Museum, the Terry Collection from Washington University in St. Louis, the D.S. Lamb Collection from Washington, D.C., and F.P. Mall Collection from Baltimore, and combined them with the archaeological collections already owned by the Smithsonian and the collections he would make on subsequent trips to Egypt and South America (St. Hoyme and Iscan 1989). In a brief paper on the "Arrangement and Preservation of Large Collections of Human Bones for Purposes of Investigation," Hrdlicka explained the rationale behind amassing skeletal collections and the procedures by which such collections should be organized (1900). Anthropological collections were to be organized first by race, and then by geographical distribution. Hrdlicka intended the collections to be used "to complete our knowledge of the more primitive, recurrent, and anomalous and define the prospective characters of each bone; and to establish the influences on the various bones of recent as well as hereditary, normal, and abnormal characters" (1900:10).

Hrdlicka defined races as strains of varying antiquity of one human species. He credits Darwin with recognizing that humankind represents one species but added that races "may properly be regarded as just subspecies, varieties, or, most simply and intelligibly, as races" (Hrdlicka reprinted in 1970:157). Hrdlicka's classification system primarily grouped humans into three main races or stems: Caucasoid (White), Mongoloid (Yellow-brown), and Negroid (Black) (1970). He also considered Australians, Papuans, Polynesians, and Semi-Mongoloids to be secondary racial groups. While Hrdlicka understood that phenotypic variation is continuous, he relied on the same external physical features as his contemporaries: skin color, hair color, etc. He did not address the heritability or malleability of these traits. Hrdlicka did not explain whether the traits he examined were influenced by the environment, and he

attributed the presence of the same trait in several groups to admixture alone. Hrdlicka consulted with the FBI on a few cases; however, there are no published accounts detailing his contributions. According to Ubelaker, "Hrdlicka's greatest contribution to forensic anthropology involved laying the foundations of science and collections that would allow the field to later develop and flourish" (1996:230).

Earnest Hooton, a former Rhodes Scholar and professor of physical anthropology at Harvard, stands out as one example of an early anthropologist who failed to explain that races are not discrete and discontinuous types. Like Hrdlicka, Hooton divided humans into White, Negroid, and Mongoloid races (Hooton 1946). Hooton's system also included six primary subraces, two composite subraces, and two residual mixed types or interbreeds. However, Hooton's concept of types, "forms so nearly alike that they seem to have been struck out by the same die or cast from the same mould" (1946:442), was based on more rigid, definable boundaries between human groups. Although Hooton acknowledged that chance, heredity, and the environment all influence phenotypic variation, he did not explain how his types were related (Armelagos et al. 1982). Hunt, a former student of Hooton, was later critical of Hooton's "use of morphological types to establish relationships between populations that were geographically distant" (Armelagos et al. 1982:311).

Hooton occasionally consulted on cases with law enforcement. In 1943, he published an article detailing the "Medico-Legal Aspects of Physical Anthropology" but in it expressed pessimism that forensic anthropologists would be consulted often enough to warrant forensic application driven research (1943). In his landmark book *Up from the Ape*, Hooton (1946) included discussions of how races ought to be classified and an appendix summarizing how age, sex, race, and stature were determined in skeletal remains.

### **The Race Concept 1939-1972: Krogman and Stewart**

The development of forensic anthropology from 1939-1972 was marked by the publication of articles for law enforcement officials, which were "geared to the needs of medico-legal officials by explaining how to analyze a skeletal case" (Iscan 1988:205). In 1939, Wilton Krogman published an article in the *FBI Law Enforcement Bulletin* detailing the contributions forensic anthropologists could make to medico-legal investigation. Stewart (1979) and Thompson (1982) credit Krogman with formally establishing forensic anthropology as a valid scientific pursuit.

In Krogman's textbook on *The Human Skeleton in Forensic Medicine* (1962), he failed to define race and instead instructed his readers to consult works by Hooton and Coon (among others) for complete discussions. By appropriating Coon's definition of race, Krogman was essentially espousing the idea that races, more specifically geographic races, are subdivisions of the human species that are "collections of populations that have certain physical features in common due to a

common (but sometimes remote) ancestry, and they extend over a geographically definable area. They are usually separated from other major races by mountains, deserts, or oceans" (Gill 1990:vii).

Physician T. Dale Stewart, who succeeded Ales Hrdlicka as curator of anthropology at the Smithsonian Institution in 1942, was influential on many fronts. As Hrdlicka's successor, Stewart took over consulting with the FBI. Along with another physical anthropologist, Thomas McKern, Stewart undertook research on unidentified Korean War dead, and in 1979, he published a forensic anthropology textbook, *Essentials of Forensic Anthropology*. He gave forensic anthropology a very public face by participating in forensic investigations, identifying war dead, and publishing forensic anthropology's methods for a broad audience.

Stewart was one of the first forensic anthropologists to acknowledge the difficulties in correlating phenotypic race (subdivisions by external appearance) with genotypic race and "hidden bony structures" (1979:227). He acknowledged that physical traits are not exclusive to one group and that modern human variation ranges along a gradient, is continuous, and is quite arbitrarily segregated. Stewart was more cautious than his colleagues about identifying race in skeletal remains because external features are not often preserved and genetic variation cannot always be identified. He encouraged his colleagues to assess both metric (head shape, nose shape, face shape) and non-metric traits in their determinations of race.

### **The Race Concept 1972-Present: St. Hoyme and Iscan, Brace, and Kennedy**

The forensic anthropologists included in this section are known for publicly defending their obligation and ability to determine race (ancestry for Brace), each publishing a pedagogical style article on the subject. St. Hoyme and Iscan, both forensic anthropologists, published a chapter in *Reconstruction of Life from the Skeleton* (Iscan and Kennedy 1989) in which they discussed the "Determination of Sex and Race: Accuracy and Assumptions." These authors differentiated between hormonal, ecological, taxonomic and political, and bureaucratic theories of race, for it was their contention that until we understand the derivation of phenotypic traits, we will not completely understand their significance. St. Hoyme and Iscan argued that in their examinations of skeletal remains, forensic anthropologists actually assign bureaucratic race, the category with the most social baggage in terms of biological determinism. These authors provided a comprehensive set of guidelines for assessing the value of osteological indicators of race. Among their suggestions are the following: that we must understand the basic etiology of each trait,

its range of variation by sex in various racial/ethnic groups, its manifestation by age (the age at which it appears and its pattern of change from childhood to old age), how it is influenced by health nutrition, occupation, or other

circumstances of an individual's life, whether there have been secular changes in its expression, [and] most important, whether the characteristic is real, but temporary. [St. Hoyme and Iscan 1989:59-60]

Further, these authors cautioned that our data on human variation might have been limited by the source skeletons. They described the contents of several of the most prominent skeletal collections in the United States and highlighted the limitations of collecting data from undocumented archaeological populations, the skeletons of the destitute, and scant sub-adult remains. These authors, like Stewart, also advocated using both morphological (non-metric) traits, scored for presence or absence, and metric traits in assessing skeletal race (St. Hoyme and Iscan 1989).

C. Loring Brace, curator of biological anthropology at the University of Michigan's Museum of Anthropology, argued in a 1995 *Journal of Forensic Sciences* article that "skeletal analysis provides no direct evidence for skin color for example, but it does allow an accurate estimate of original geographic origins. African, eastern Asian, and European ancestry can be specified with a high degree of accuracy" (1995:172). According to Brace, the characteristics upon which determinations of ancestry are made are clinal in their worldwide distribution. He argued that these traits are not discontinuous or discrete, nor are they possessed exclusively by one and not another group of people. Brace thought that the traits are best understood as markers of biological kinship. He further explained that determinations of ancestral characteristics are "of necessity completely unrelated to the issues of adaptation or fitness that are at the heart of evolutionary biology" (Brace 1995:174).

Brace stopped using Hrdlicka and Hooton's Caucasoid, Mongoloid, and Negroid categories in favor of geographical region designations: African, East Asian, and European ancestry. No longer were disparate groups like Africans and Australians to be lumped together as Negroids according to skin color where geography and migration do not suggest recent common biological ancestry. Brace instead argued that variation should be understood in terms of geographic origins and biological kinship (1995).

Ken Kennedy (1995) echoed Brace's suggestions in a subsequent *Journal of Forensic Sciences* article. In his brief article, Kennedy, a forensic anthropologist and professor of ecology and systematics at Cornell, defended the need for forensic anthropologists to teach students how ancestry is determined. He argued that ancestry identification is:

a justifiable scientific endeavor established upon a reality of clinal, non-concordant and independent phenotypic features, of which many are discrete traits under genetic control, which are geographically diffused so that a tally of trait frequencies can serve as powerful indicators of the gene pools of



individuals we seek to identify in a forensic anthropology investigation.  
[Kennedy 1995:799]

The collective message of Kennedy and Brace is that determinations of ancestry are performed out of necessity in special situations, but that "from a strictly scientific point of view, they can only prevent us from understanding the nature and significance of human biological variation" (Brace 1995:175). Forensic anthropologists realize that they are perpetuating a dichotomy: denying that "races are natural entities within our species" (Kennedy 1995:798) while identifying race/ancestry for law enforcement officials, who may be unaware of the current debate (Sauer 1992, Smay and Armelagos 2000, Gill and Rhine 1990). This dilemma raises the question of whether forensic anthropologists ought to continue classifying individuals. Problems with how the individuals in our skeletal collections were included and classified, the ever blending nature of human genetic variation, and the secular trends already identified by skeletal biologists further complicate the practice of assigning ancestry in the unidentified.

### **The Skeletal Collections**

Forensic anthropology's techniques have been devised using historical data and historically assembled skeletal collections and war dead. While the war dead were primarily young men who met sudden deaths, the skeletons in the major collections primarily represent the underprivileged of society, individuals otherwise destined for a potter's field. These individuals may have had poor diets and limited access to medical care. Further, the skeletons were collected during a time when typological definitions of race were prevalent. The Terry Collection of skeletal material curated at the National Museum of Natural History, for example, was amassed between 1914 and 1965. The validity of biological races in humans, and the difference between race and biological ancestry, was not questioned during those years. The exact biological ancestry was often not known for the individuals in our major collections, and racial classifications were assigned based on soft tissue morphology (St. Hoyme and Iscan 1989).

Smay and Armelagos (2000) eloquently pointed out some of the ramifications of using the racial classifications assigned to the skeletons in our reference samples to build anthropometric methods. These authors discussed the assumptions implicit in Rhine's (1990) analysis of non-metric traits present in 87 crania of "known race" from the University of New Mexico's Maxwell Museum. "Rhine never explains how the race of the individuals in the sample came to be known, although one is led to believe that it was either self-reported or attribution based on soft tissue appearance after death" (Smay and Armelagos 2000:21). Simply taking skeletal material assigned to races as representative of particular ancestral groups fails to account for how social races were delineated when the skeletal material was collected. Further, the race

assigned to each skeleton may not account for the individual's actual biological ancestry, which may have included many sources (Goodman 1995).

Although the major collections are still the most easily accessed for research today, they record human variation from between 50 and 100 years ago, likely not the mosaic of the modern American population. To continue to test methods using the skeletons from the Smithsonian's Terry Collection, The Cleveland Museum of Natural History's Hamann-Todd Collection, and Montagu Cobb Collection at Howard University assumes that human variation is static and that snapshots of diversity taken by collecting skeletal remains from the indigent and underprivileged decades ago are typical of the contemporary population. We know this is not the case: human variation is dynamic and secular trends exist (Ousley and Jantz 1997, Jantz and Meadows Jantz 2000, Jantz 2001). Further, these skeletal collections were not systematically assembled to represent cross sections of their source cities or regions. Therefore, we cannot assume that the skeletons represent the variation present in the American population when the collections were assembled, let alone the variation present in the modern American population (Sauer 2004). Stratified random sampling of all American communities, socioeconomic classes, sexes, and age groups would be required for this to be possible. This does not mean that the major skeletal collections are useless. Rather, we must stop merely looking for more "racially discriminant features" and start questioning the reference skeletons from which we take measurements.

## Discussion

Law enforcement officials will continue consulting with forensic anthropologists on cases of unidentified human skeletal remains. Therefore, we ought to perpetually reevaluate our methods and techniques. While forensic anthropologists have been determining race in skeletal remains for the better part of a century, we rarely question the theoretical and empirical bases for these determinations.

Attempts to update the anthropometric formulae by assembling more skeletal collections are inherently flawed so long as the skeletons are sorted by race. New skeletal collections have been established, including one at the University of Tennessee in Knoxville. Skeletons from forensic cases are being collected there. These skeletons are assumed to represent the diversity of the south central United States. While these skeletons have been classified by race, we must recognize that this is akin to shooting a moving target. Bureaucratic categories of race have changed and continue to change (Lee 1993).<sup>2</sup> Meanwhile gene flow between ancestrally separate populations has been going on for millennia and may be accelerating because of widespread immigration and increasing exogamous mating.

Even revising existing formulae with data collected from these or other modern skeletons may not be sufficient to make assessing ancestry a reliable and

worthwhile practice. While it is essential that future research in skeletal biology continue to develop techniques for the identification of skeletal remains, as much consideration (if not more) should be given to the nature of the variation and its heritability. The American population is so heterogeneous that most individuals are of multiple ancestries. A single skeleton may exhibit a mosaic of features from multiple ancestral populations. In addition, individuals may not be aware of their actual ancestry or of how many ancestral groups comprise their family lineage.

Further, personal identity is malleable. Individuals of multiple ancestries may regard themselves as belonging to more than one sociocultural race. For example, an individual of African, Native, and European American ancestry may regard him/herself as Black, Indian, or White. From that individual's skeletal remains, we may discern traits from three ancestral populations (African, Asian, and European American). Since missing person reports are organized by singular bureaucratic categories of race, law enforcement personnel are seeking a singular answer. So we give law enforcement an assignment that represents the preponderance of the evidence. If in this hypothetical analysis, I reported that "the individual is most likely of African American ancestry, but Asian American and European American heritage cannot be ruled out" and the individual self-identified as Native American, I might misdirect law enforcement's attention, the opposite of our intended goal.

Further, there are no guidelines or precedents for interpreting evidence of multiple ancestries. Our "most likely" or "most probably" statements are not backed by statistical probabilities based on large sample sizes of individuals of acknowledged or documented multiple ancestries. The posterior probabilities calculated by FORDISC (software developed by University of Tennessee faculty) use skeletons sorted by race. To then use those probabilities to determine which of multiple biological ancestries was statistically most likely is flawed because race and ancestry are not the same thing. When non-metric traits indicative of multiple ancestries are present, we do not know whether or which ancestry would have dictated external phenotype. We therefore have no data on which of the multiple ancestries to suggest to law enforcement. Forensic anthropologists must always be prepared to testify to their findings in court (Galloway et al. 1991), but with the new emphasis in courtroom presentations on the levels of reliability, our assessments can only be tested against "known" race with all the limitations that implies.

There are so many more fascinating areas to explore within skeletal variation. We do know that no one trait is diagnostic of any ancestral group. It is the statistical frequency or clustering of traits that we measure. We are assuming these traits are under genetic control, but genetic research has not demonstrated this. Because we do not know which traits are under genetic control or to what extent they are genetically controlled, we do not know that the traits are discrete. They may be influenced by pleiotropy, epigenetic factors, or the environment. We assume that the traits are discrete and that some ancestral traits are dominant over others. We cannot further

assume that dominance of inherited traits equals self-ascribed identity in light of ancestry. Personal identity can be and often is ascribed in spite of ancestry. However, the variation in and of itself is a rich topic for research.

### **Recommendations**

Much of the research currently being conducted in the existing skeletal collections ignores the potential biases inherent in the collections and does not theoretically advance the science. The skeletal collections could help us address some of the theoretical weaknesses in assessing ancestry if the right research questions were posed. Instead of conducting research using the racial classifications assigned to each skeleton, data could be collected blindly to find the range of variation for any given trait. Such research could help determine whether a specific trait is clinal or sorts into broad categories, regardless of etiology. Most of the skeletal collections are static and are not evolving with the rest of the human population. Comparing raw data from skeletal populations separated by decades would help us determine just how much morphological change has occurred. The question we need to ask is whether the amount and kind of variation present in the skeletal collections matches modern variation. A study that addressed this question would advance the science and has the potential to justify continued use of the existing skeletal collections and the amassing of additional collections.

Forensic anthropology as a discipline has matured to the point where its dependence on applied research is no longer sufficient. We must begin to recognize the contributions we can make to physical anthropology. By discontinuing the use of the term race, we can further the goal of demonstrating that race is a sociocultural concept that is not congruent with either biological ancestry or ethnicity (Caspari 2003). We could unanimously adopt Brace's (1995) concept of ancestry by geographic origin or Goodman's (1995) continental ancestry, yet we must recognize that the terms African, European, and Asian American have limitations as well (à la Lewontin 1972). Assessments of ancestry can help us provide additional information to law enforcement but do not force forensic anthropologists to perpetuate use of the term race.

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